remote Cœlenterate ancestor. The author appears to forget that these chambers are formed in a fundamentally different way and order, by the ingrowing of mesenterial folds. Moreover, one of the many serious objections to this theory is that it fails utterly to bridge over the gap between the Cœlenterate and the Cœlomate, and leaves quite unexplained the structure of the Platyhelminth and Nemertine. It is just here that the Gonocœle theory has proved so valuable, giving the only intelligible interpretation of the morphology of these lower forms, founded not on vague speculations, but on the comparison of well-established facts in comparative anatomy. This theory, founded and supported by Hatschek, Ed. Meyer, Lang, and many others, Prof. MacBride dismisses with scorn, and the remarkable statement that any vogue it has obtained "is only in consequence of the myopic concentration of attention on the facts of development in a limited number of groups, and the neglect of the facts of development in other groups" (p. 166).

The suggestion made on p. 661 that the diverticula of the gut in the Platyhelmia represent the cœlom takes us back some thirty years to a time before the structure of these animals was understood, besides being in direct opposition to the teaching of cell-lineage so clearly described in this very volume. The determination of the homology of the mesoblast cells in Platyhelminths, Nemertines, Annelids, and Molluscs is surely one of the most important contributions of modern embryology to the morphology of the Invertebrata.

The author is less happy in his phylogenetic speculations than in his descriptions of development. So much is he under the influence of the recapitulation theory that almost all free-swimming larvæ appear to him as scarcely modified ancestral forms. It need scarcely be pointed out that the mere prevalence of a common larval form in one or several groups of animals does not in itself prove that this larva closely resembles the adult common ancestor. It may be taken as good evidence that the ancestor also possessed such a larval stage, and is therefore an indication of the close affinity of the animals concerned. Beyond this it is unsafe to theorise without other evidence from comparative anatomy or palæontology. It should never be forgotten that ancestors were not larvæ, but self-supporting adults capable of reproduction. Prof. MacBride would have done better to follow the example of Sir Ray Lankester, who long ago, when he reconstructed his famous Archi-mollusc, took as his model not the trochosphere nor even the veliger larva, but a creeping animal. If we adopted the author's theories as to the ancestral significance of larval forms, we should have to suppose that a large number of the characters held in common by the various groups have been independently developed, a conclusion for which there would seem to be no justification.

When discussing general questions in a final chapter Prof. MacBride appeals to hormones as affording a rational explanation of the *modus operandi* for the supposed "inheritance of acquired characters." This view is, of course, not new; Delage, Vernon, and Cunningham have in turn supported it. But, quite apart from the evidence of such inheritance, it is difficult to see how these internal secretions could become incorporated into the blastogenic factors of development.

We congratulate both the author and the editor on the production of this handsome text-book. It will doubtless be warmly welcomed by all English-speaking students and teachers of embryology, and take the place it deserves among the standard works on the subject.

E. S. GOODRICH.

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## *THE BUTTERFLIES OF AUSTRALIA.*

*The Butterflies of Australia: a Monograph of the Australian Rhopalocera.* By G. A. Waterhouse and G. Lyell. Pp. vi+239+plates. (Sydney: Angus and Robertson; London: Oxford University Press, 1914.) Price 42*s.* net.

THE scientific study of the butterflies of Australia is certain to be greatly advanced by the appearance of this admirable work, although it is to be feared that the high price will tend to prevent a very wide circulation. It is obvious, however, that a costly book is implied by the presence of forty-three excellent quarto plates, of which four are coloured. In addition to this abundant and most necessary illustration in plates, the reader is provided with numbers of text figures as well as a valuable map-index of localities. One of the plates is devoted to larvæ and pupæ, one coloured plate to the variations of the Satyrine butterfly *Tisiphone joanna,* the three others to special Satyrinæ, Lycænidæ, and Hesperidæ. The remaining thirty-eight uncoloured plates contain 793 figures, all natural size, of the 332 species recognised by the authors as at present known in Australia.

Especial attention has been given to geographical distribution, and the authors have made a point of examining long series of specimens wherever available. In this work they have received help from many students of the Australian Rhopalocera, while Mr. Waterhouse's extremely fine collection, seen by the present writer during the recent visit of the British Association, has

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clearly been developed with the object of producing this volume.

The trinominal system of nomenclature, the principles of which are clearly explained in the introduction, is followed by the authors as by most naturalists who have made a special study of geographical distribution. At the same time, new subspecies or geographical races have only been created when plenty of material was available. The authors have wisely deemed it "preferable that a race should continue undetermined rather than the racial characters should be wrongly described or a new race erected on insufficient grounds."

The exigencies of space prevent any detailed discussion or description of the work, but it must be mentioned that the remarkable *Euschemon* is considered as a "Skipper" (Hesperidæ) and not as a moth. This conclusion appears to the present writer to be entirely sound, although the primary division of Lepidoptera into "butterflies" and "moths" is, of course, artificial and merely a matter of convenience.

In addition to the description of the species and the groups to which they belong, occupying nearly the whole of the volume, there is an introductory section with a brief historical account of Australian work and an excellent general description of the Lepidoptera, together with the anatomical features relied upon by the systematist. A concluding section, with "Notes upon Collecting and Collections," complete the work by rendering it a sufficient guide to the beginner.

The keen Australian naturalist is now provided with a foundation upon which to build. The present work will tell him what he is dealing with, and will indicate much of the work that remains to be done. Blank records of food-plants and of larval and pupal stages will suggest, to those interested in breeding, one of the most fascinating of all inquiries. We may hope that the bionomic problems presented by the Australian Lepidoptera, as yet scarcely attacked at all, will now receive attention; that geographical variation, so specially studied by the authors, will forthwith be advanced by the efforts of a band of new observers.

The naturalist living in the cooler parts of Australia need not be discouraged by comparing his species with the grander forms of the tropical north. These latter are for the most part identical with or very closely allied to Papuan species, while his own less magnificent butterflies are characteristic of the great southern continent. At the same time. the resident in northern Queensland has the opportunity of solving complex problems of tropical life with its elaborate inter-relationships—an opportunity of which Mr. F. P. Dodd has taken such great advantage. With the present work as a guide we may look forward to a rapid advance along many lines in our knowledge of the butterflies of Australia.

E. B. P.

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## PHYSICAL ANTHROPOLOGY.

*Lehrbuch der Anthropologie in Systematischer Darstellung. Mit besonderer Berücksichtigung der anthropologischen Methoden für studierende Aerzte und Forschungsreisende.* Von Prof. R. Martin. Pp. xvi+1181. (Jena: G. Fischer, 1914.) Price 35 marks.

IN these later years the Anthropological Institute of the University of Zürich has acquired a very high reputation amongst anthropologists. The success of Zürich as a centre of anthropological research and teaching is due to Prof. Rudolf Martin who, these twenty years past, has gathered round him and trained a band of young men, who are now spreading abroad the reputation of the new Swiss school.

In the work under review, Prof. Martin gives a systematic account of twenty years of experience as an expert anthropologist, detailing his methods of measurement, his manner of making records and describing the principles on which his methods are based. His text-book is much more than a technical manual; it is really an encyclopædia of knowledge relating to the size and shape of body in all races of mankind. There was great need for a standard work on physical anthropology; Prof. Martin has supplied that need.

The modern conception of the scope of physical anthropology and the relative importance attached to each of its branches will be made clear by a summary of the contents of Prof. Martin's text-book. The largest section is given to the skull; 422 pages out of a total of 1069 are devoted to the methods and results of craniology. The next important section is that which deals with the living body—its measurements, proportions, pigmentation, growth, etc.; to this subject considerably more than a third of the total book is assigned. A separate section is devoted to a consideration of the skeleton—189 pages. Thus, the major part of this work is devoted to the skull, skeleton, and external characters of the body.

The two opening sections, although condensed—amounting altogether to 102 pages—are both useful and important. These opening sections deal with anthropological methods, particularly with the best means of expressing results in graphic and in mathematical forms. The classi-

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